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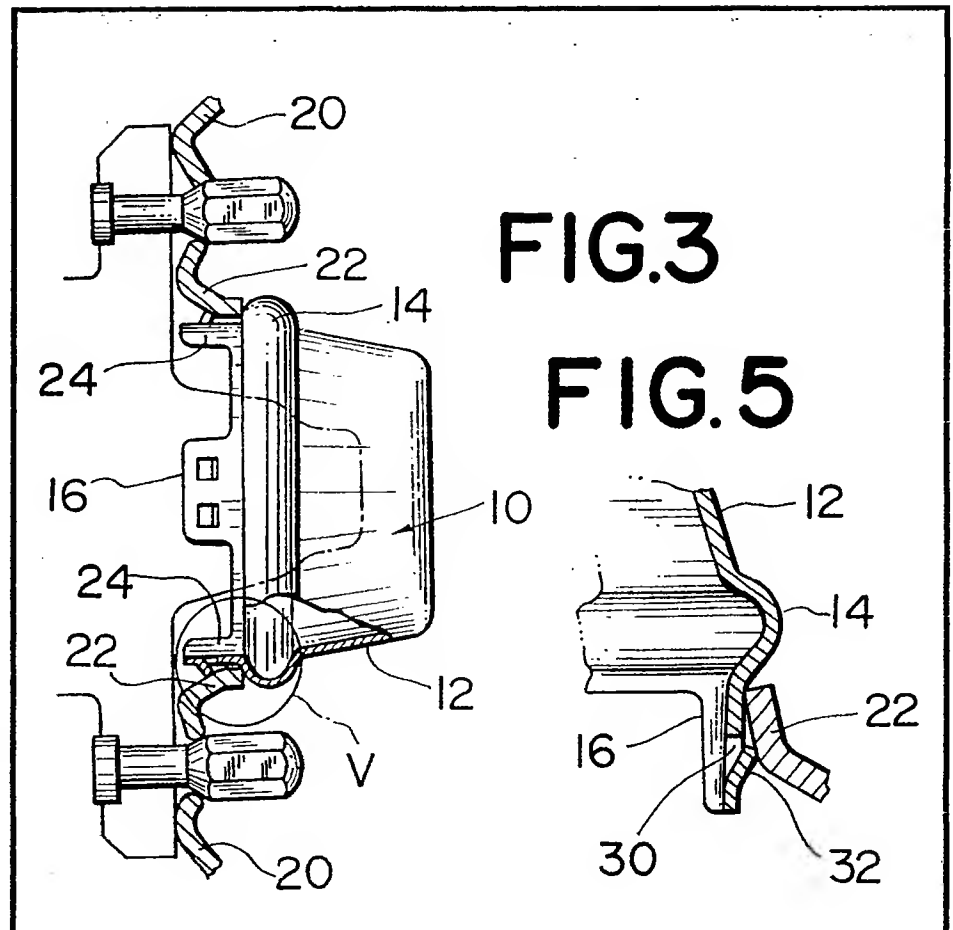
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(54) Attaching hub caps to wheels

(57) A hub cap comprises a body 12, and a plurality of lugs 16 extending from the rim of the body and each formed with at least one outwardly projecting resilient tongue 32 to contact with the inner surface of a lip portion 22 surrounding the central aperture of a disc wheel 20, to secure the cap to the wheel. The illustrated cap has an integral rib 14 but this may be omitted. The lugs 16 may also be omitted and the tongues 32 formed directly on the rim of the cap.



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FIG. 1
PRIOR ART

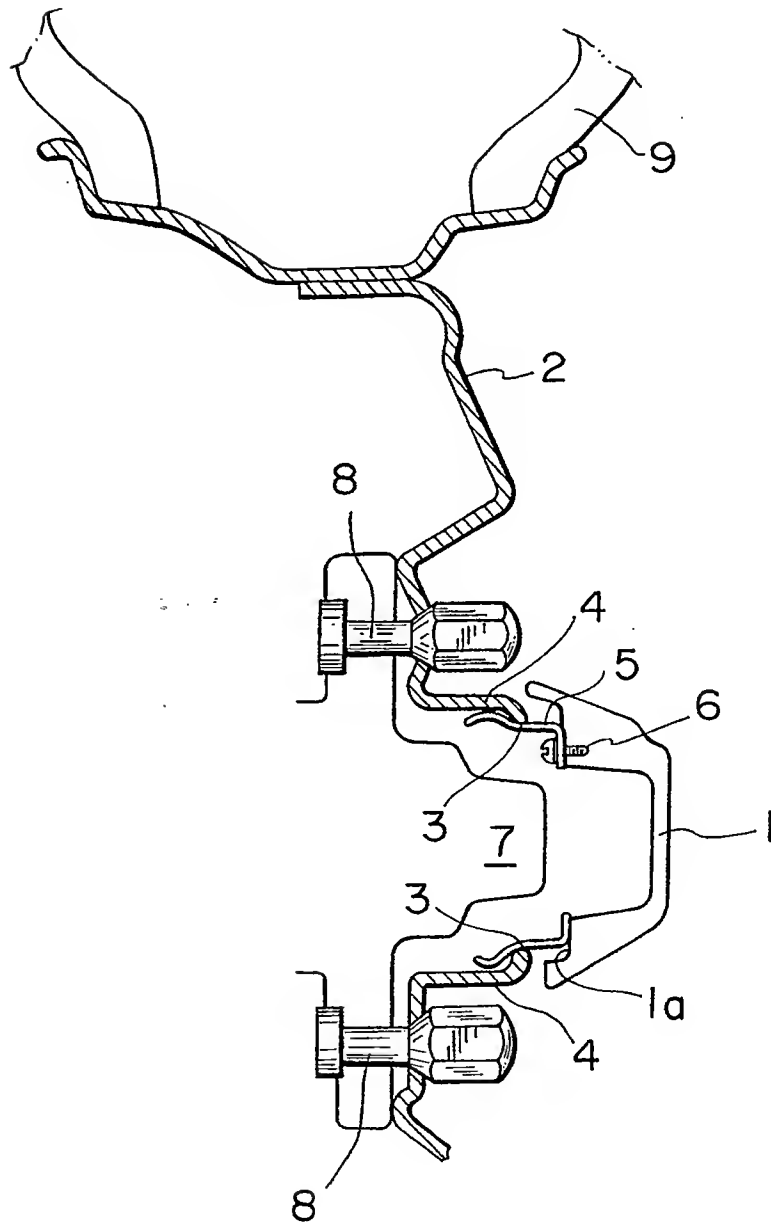


FIG.2
PRIOR ART

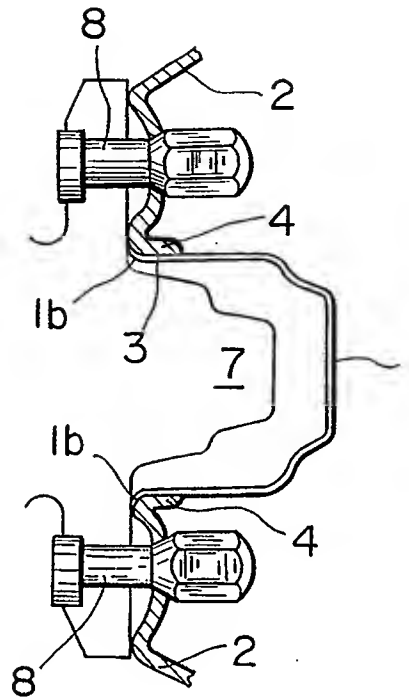


FIG.6

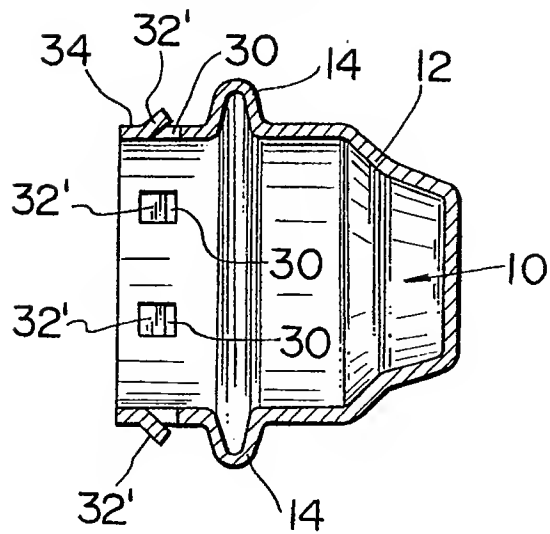
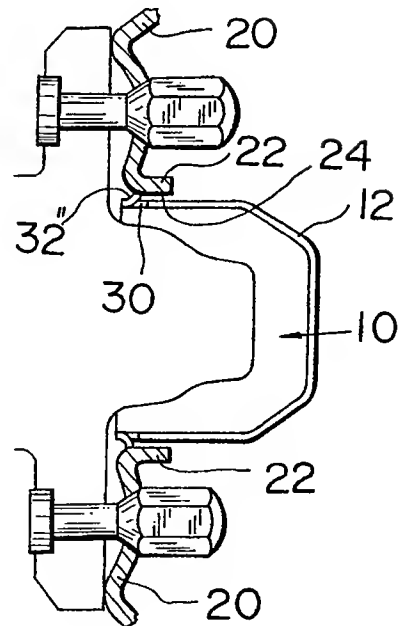


FIG.7



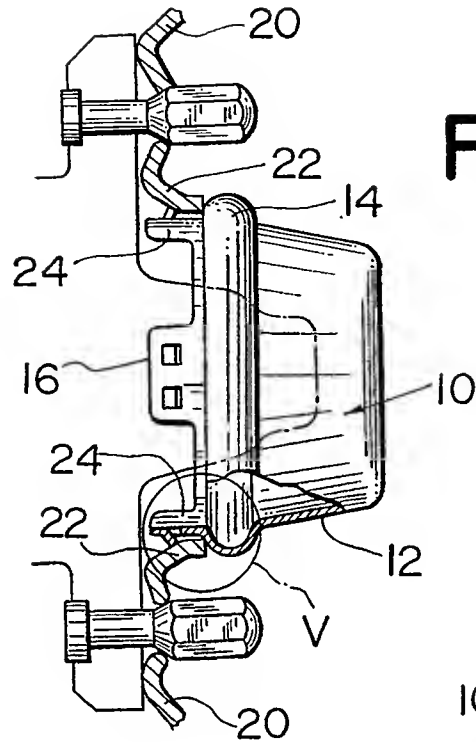


FIG. 3

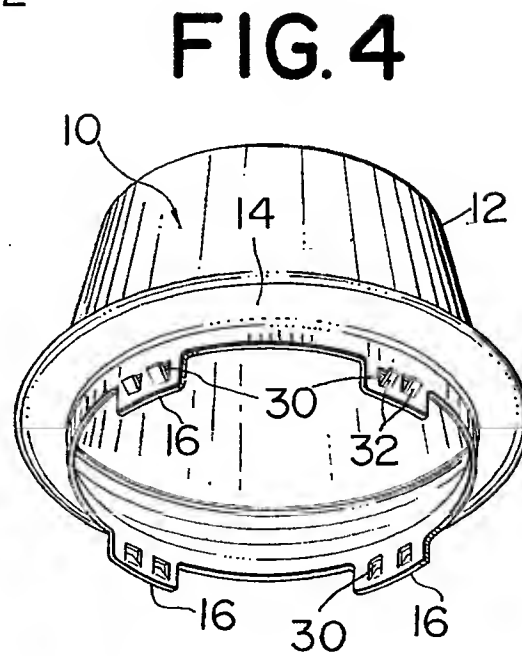
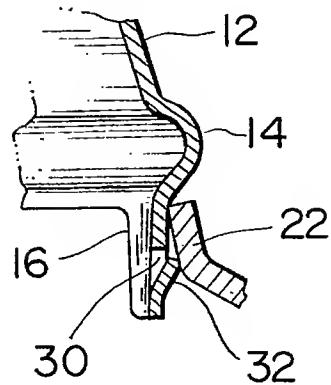


FIG. 4

FIG. 5



SPECIFICATION

Wheel cap attaching structure

5 This invention relates to an automotive vehicle wheel and, more particularly, to a structure for attaching a wheel cap to a disc wheel for ornamentation of the automotive vehicle wheel.

10 It is normal practice to attach a cup-shaped wheel cap to a disc wheel so as to cover the hub hole formed in the disc wheel. However, conventional wheel caps have had numerous difficulties as will now be described.

15 Fig. 1 is a fragmentary sectional view showing a conventional structure for removably attaching a cup-shaped wheel cap 1 to a disc wheel 2 so as to cover the hub hole 3 defined by the lip portion 4 of a disc wheel 2. In such a conventional structure, the wheel cap 1 has appropriately shaped resilient clips 5 secured to its annular under surface 1a by bolts 6. The resilient clips 5 are press-fitted on the inner (in the illustrated case) or outer peripheral surface of the lip portion 4 of the disc wheel 2. The reference numerals 7, 8 and 9 designate a hub, hub mounting bolts and a tyre, respectively.

One of the difficulties encountered with such a conventional structure is that the lip portion 4 of the disc wheel 2 is formed to have a special configuration for engagement with the resilient clips 5. This requires an increased number of disc wheel producing processes and makes it difficult to form the disc wheel in the required configuration by pressing. In addition, it requires the resilient clips 5 to be produced separately from the wheel cap. Furthermore, it tends to cause looseness of the wheel cap and production of noises due to vibrations.

Fig. 2 is a fragmentary sectional view showing another conventional structure which employs a disc wheel 2 having its lip portion 4 formed in a natural configuration. In this structure, the cup-shaped wheel cap 1 has a flange 1b integrally formed with the rim of the wheel cap 1 and inserted through the hub hole 3 from the inside of the disc wheel 2.

One of the problem with such a conventional structure is the difficulty encountered in assembling the wheel.

It is therefore an object of the present invention to eliminate the above-described disadvantages encountered in conventional wheel cap attaching structures.

Another object of the present invention is to provide an improved wheel cap attaching structure which permits easy and inexpensive production of wheel cap and disc wheel members.

Still another object of the present invention is to provide an improved wheel cap attaching structure which permits easy and certain at-

According to the present invention, these and other objects are accomplished by a structure for attaching a wheel cap to a disc wheel to cover the hub hole defined by the lip

70 portion of the disc wheel, the wheel cap comprising a cup-shaped cap body, a plurality of legs extending from the rim of the cap body away from the head of the cap body, each of the legs formed with at least one tongue turned outwardly to form a resilient lance broadening in the direction opposite to the direction of insertion of the wheel cap into the hub hole from the outside thereof, and the tongues placed in resilient pressure contact with the inner surface of the lip portion when the wheel cap is inserted into the hub hole.

The following explanation of several preferred embodiments of the present invention will help in the understanding thereof, when taken in conjunction with the accompanying drawings, which, however, should not be taken as limiting the present invention in any way, but which are given for purposes of illustration only. In the drawings, like parts are denoted by like reference numbers in the several figures, and:

Figure 1 is a fragmentary sectional view showing a conventional wheel cap attaching structure as stated above;

95 *Figure 2* is a fragmentary sectional view showing another conventional wheel cap attaching structure as stated above;

Figure 3 is a fragmentary sectional view showing one embodiment of a wheel cap attaching structure made in accordance with the present invention;

Figure 4 is a perspective view showing the wheel cap of Fig. 3;

Figure 5 is an enlarged sectional view showing the significant portion of the present invention indicated by the circle V of Fig. 3;

Figure 6 is a sectional view showing a second embodiment of the present invention; and

110 *Figure 7* is an fragmentary sectional view showing a third embodiment of the present invention.

Referring to Figs. 3 to 5, there is illustrated one embodiment of a wheel cap attaching structure made in accordance with the present invention. The wheel cap 10 comprises a cup-shaped wheel cap body 12, an outwardly protruded collar 14 formed integrally with the rim of the wheel cap body 12, and a plurality of resilient legs 16 (in the illustrated case 4 legs) extending from the collar 14. The disc wheel 20 has a lip portion 22 defining a hub hole 24 with a circular opening. The lip portion 22 has a conventional configuration such as to have its diameter naturally increasing toward its inside and have its inner surface formed with no special protruded or stepped portion for engagement with the legs 16 of the wheel cap 10.

As best shown in Fig. 4, each of the legs

16 is formed with at least one U-shaped slit 30 (in the illustrated case 2 slits) to form a tongue 32. The tongue 32 is turned outwardly about 30° with respect to the leg 16 as best shown in Fig. 5. Thus, the tongue 32 serves as a strong leaf spring.

To attach the wheel cap 10 to the disc wheel 20, the wheel cap 10 may be pushed into the hub hole 24 until the collar 14 abuts against the rim of the lip portion 22. During this, the tongues 32 of the legs 16 are pushed against and bent inwardly by the inner surface of the lip portion 22. In the fully engaged position of the wheel cap 10, the tongues 32 of the legs 16 are in pressure contact with the inner surface of the lip portion 22 so as to hold the wheel cap 10 secured to the disc wheel 20. Figs. 3 and 5 illustrate the wheel cap 10 fully engaged with the disc wheel 2.

With such a structure, no noise is produced due to vibrations during vehicle running and the tongues 32 abut against the inner surface of the lip portion 22 of the disc wheel 20 so as to hold the wheel cap 10 fixed to the disc wheel 20 against forces tending to move the wheel cap 20 outwardly. In addition, the collar 14 covers the hub hole 24 to provide a good appearance.

To remove the wheel cap 10 of the present invention, the wheel cap 10 may be strongly pulled with a suitable tool applied on the rear side of the collar 14. During this, the tongues 32 of the legs 16 are resiliently deformed.

Fig. 6 illustrates a second embodiment of the present invention. This embodiment is substantially similar to the first embodiment except that the leg 16 extends continuously around the rim of the wheel cap 20 to form a skirt 34 and a plurality of tongues 32' are formed in the skirt 34.

Fig. 7 illustrates a third embodiment of the present invention. In this embodiment, the collar 14 is eliminated and a plurality of tongues 32'' are formed in its legs or skirt.

The above described wheel cap attaching structure provides the following development advantages: First, it permits easy and inexpensive production of wheel cap and disc wheel members since the configuration of the wheel is simple. Second, it permits easy and certain attachment of a wheel cap to a disc wheel. The wheel cap can be attached to the disc wheel even if the disc wheel is mounted to an automotive vehicle.

CLAIMS

1. In a structure for attaching a wheel cap to a disc wheel to cover the hub hole defined by the lip portion of said disc wheel, said wheel cap comprising a cap body, a plurality of legs extending from the rim of said cap body away from the head of said cap body, each of said legs formed with at least one tongue turned outwardly to form a resilient

lance broadening in the direction opposite to the direction of insertion of said wheel cap into said hub hole from the outside thereof, and said tongues placed in resilient pressure contact with the inner surface of said lip portion when said wheel cap is inserted into said hub hole.

2. A modification of the structure according to claim 1, wherein said legs extend continuously around said rim of said cap body.

3. A structure according to claim 1, wherein said cap body is formed with a collar extending outwardly from the outer peripheral surface thereof so that said collar abuts against the rim of said lip portion when said wheel cap is fully inserted into said hub hole.

4. A wheel cap comprising a cap body, a member or members extending from the rim of the cap body in a direction away from the head of the cap body, the or each member having at least one resilient tongue extending outwardly from the member and orientated in a manner such that the tongue is deflected inwardly as the cap body is positioned on a wheel.

5. A wheel cap substantially as herein described with reference to and as illustrated by Figs. 3, 4, and 5, or Fig. 6 or Fig. 7 of the accompanying drawings.

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